

Associations between Library [EZproxy] Use and Undergraduate Student GPA, 2016-2019

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Felix Kabo, Doreen Bradley, Stephanie Teasley, Ken Varnum



THE LIBRARY LEARNING
ANALYTICS PROJECT (LLAP)
<https://libraryanalytics.org/>

“The Impact of the Academic Library on Learning in the University,” LG-96-18-0040-18,
National Leadership Grant, Institute of Museum and Library Services

LLAP STUDY OBJECTIVE

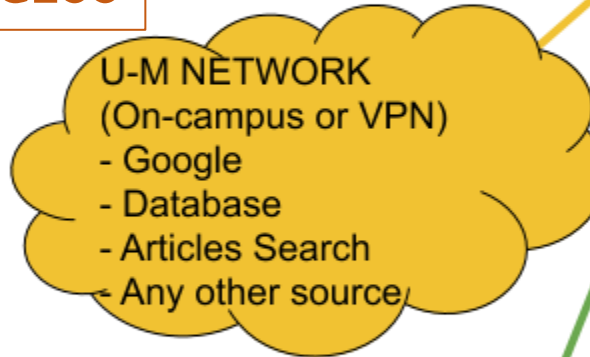
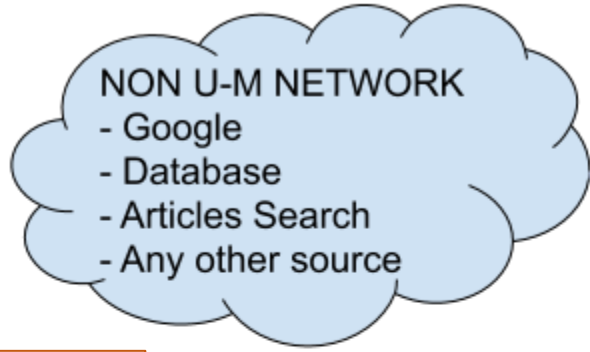
- **Goal 1:** To understand how the [U-M library](#) impacts learning, specifically in the areas of course instruction...

LIBRARY ACCESS & FLOW

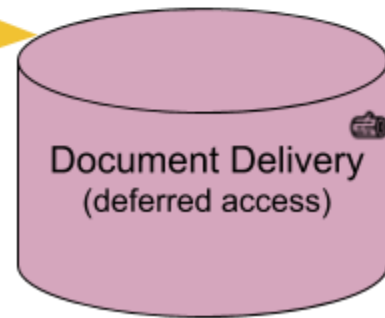
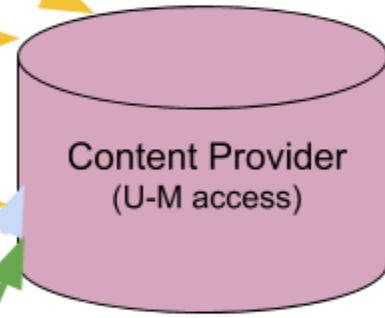
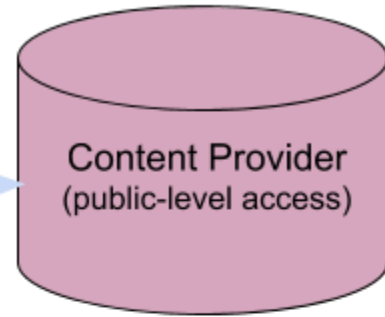
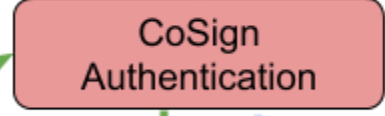
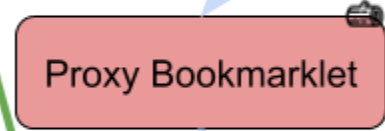
Starting Points

Mediation Points

Access Points

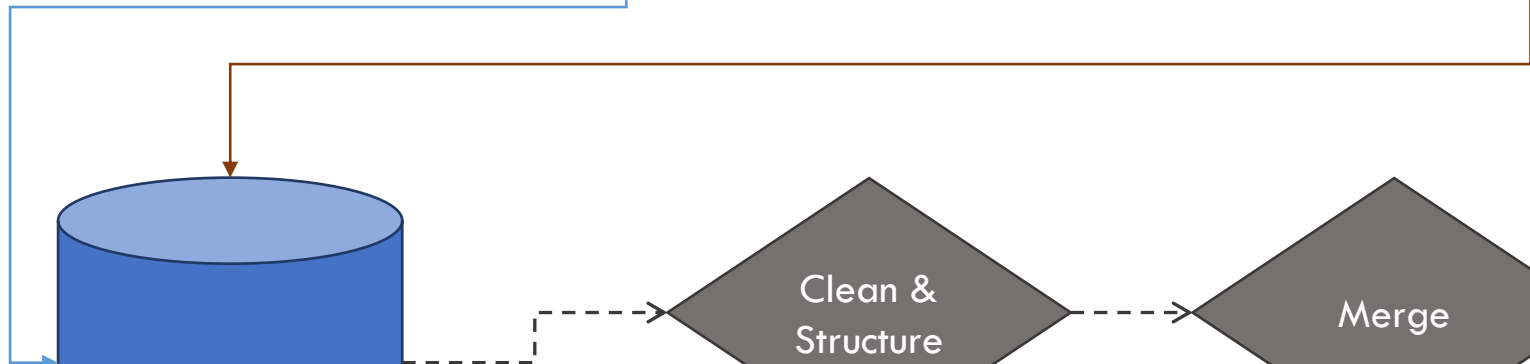
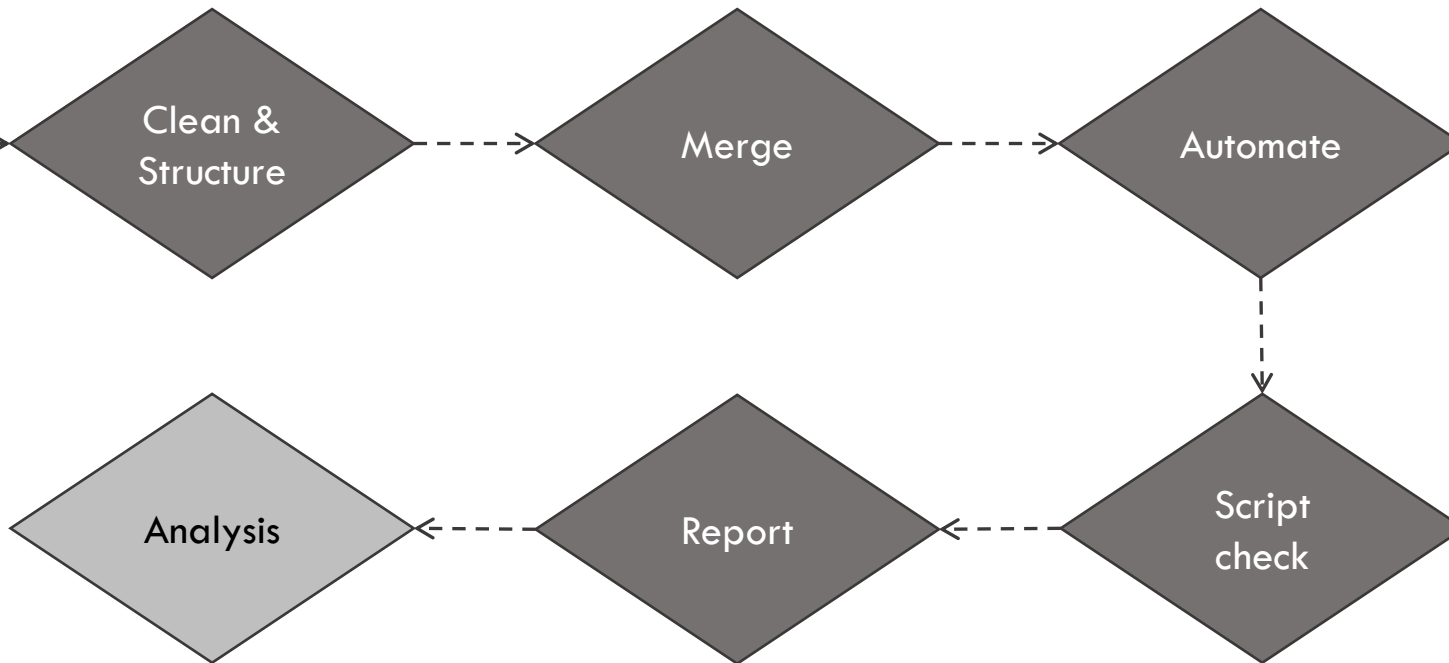
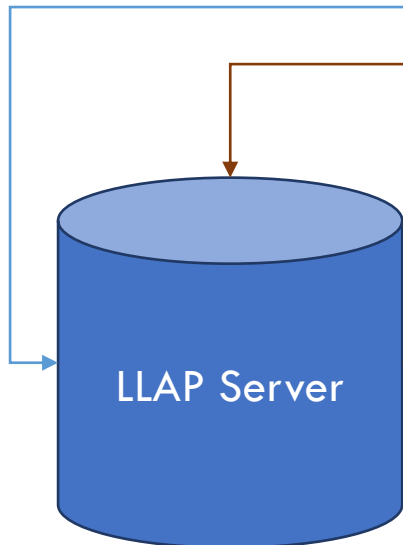
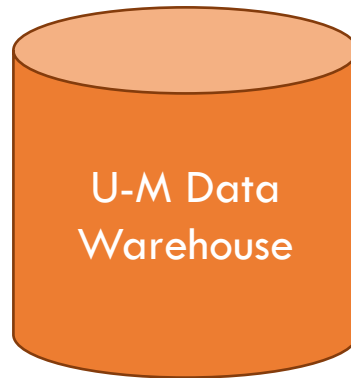
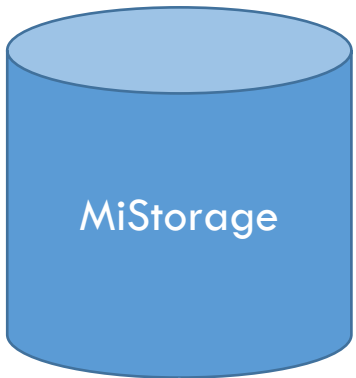


LIBRARY ACCESS



Library logs

Learning Analytics Data Architecture (LARC)



STUDY BACKGROUND

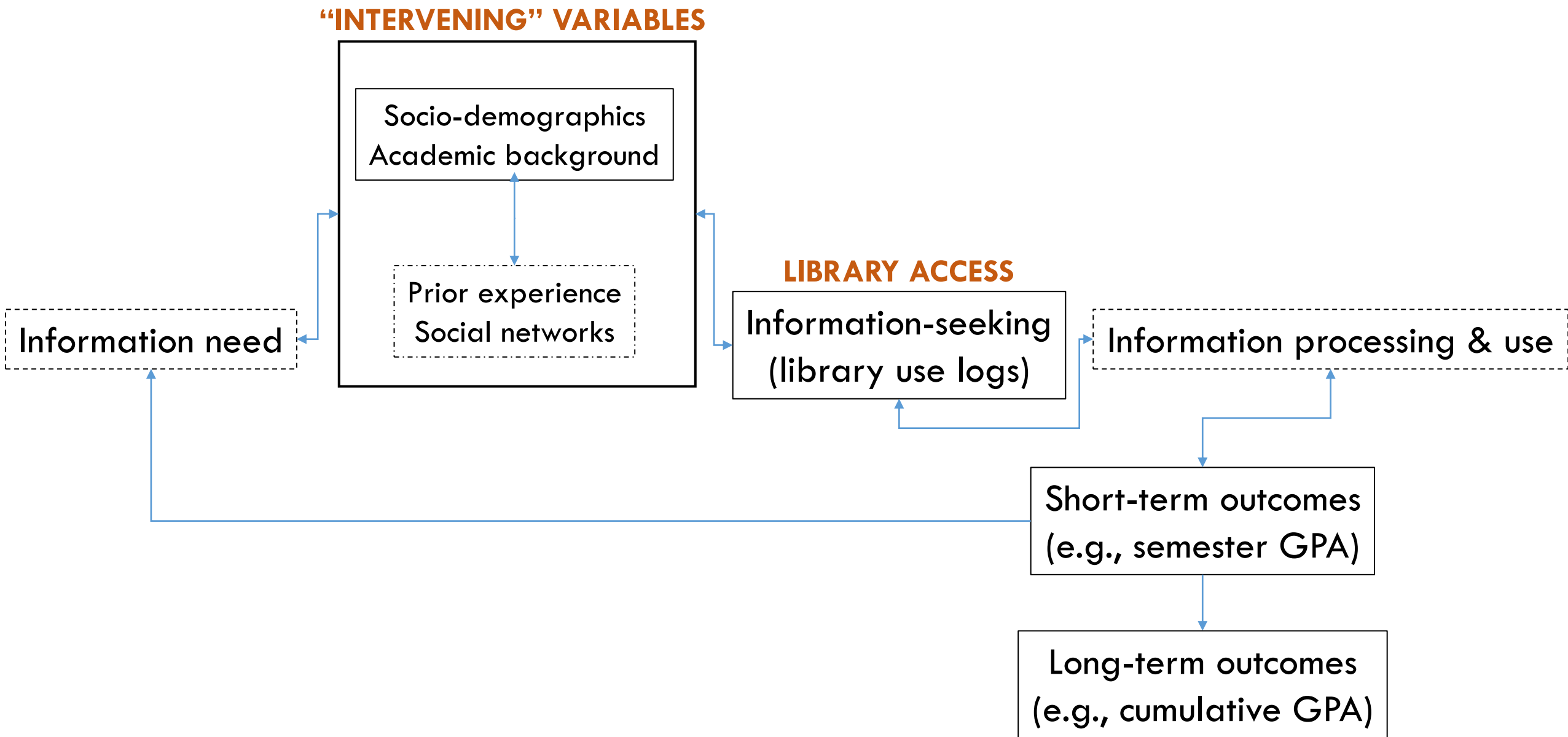


Figure 1. Theoretical framework for associations between library use and student outcomes adapted from Wilson (1999) and Johnson (1997) models of information behavior.

LITERATURE

- Information behavior
 - Contingent on social contexts, socio-demographics, individual knowhow, and access to and ease of use of technology.
- Campus residency & student learning/performance/retention
 - Racial disparities
 - On-campus versus commuters
- Digital divide/disparities
 - Demography and geography
 - K-16 pipeline

SAMPLE & VARIABLES

- Study population is all 45,254 undergraduate students that were enrolled at the University of Michigan (U-M) in the six semesters from Fall 2016 – Winter 2019
- Dependent variables: semester & cumulative grade point averages (GPAs)
- Independent variable: library use (having one or more EZproxy sessions in an academic term)
- Controls: campus residency status*, gender, race, first gen status, family income, class level, high school GPA

FINDINGS & DISCUSSION

Table 1. Percentage of students associated with EZproxy sessions by semester, Fall 2016 – Winter 2019

ACADEMIC TERM	NUMBER OF STUDENTS	EVER EZproxy SESSION	% ≥ 1 EZproxy
Fall 2016	28,682	16,605	58%
Winter 2017	27,408	13,434	49%
Fall 2017	29,161	16,034	55%
Winter 2018	27,852	14,855	53%
Fall 2018	29,726	16,191	54%
Winter 2019	28,355	16,299	57%

Table 2A. Percentage of students associated with EZproxy sessions by socio-demographics and academic background, Winter 2019

VARIABLE	CATEGORY	NUMBER OF STUDENTS	EVER EZproxy SESSION	% ≥ 1 EZproxy
First Gen Status	Don't Know	47	32	68%
	First Gen	3,890	2,310	59%
	Not First Gen	24,418	13,957	57%
Family Income	Less than \$25,000	1,507	923	61%
	\$25,000 - \$49,999	2,212	1,269	57%
	\$50,000 - \$74,999	2,009	1,217	61%
	\$75,000 - \$99,999	2,074	1,213	58%
	More than \$100,000	13,951	7,892	57%
	Don't Know	515	278	54%
	Missing Income Information	6,087	3,507	58%
Class Level	Freshman	2,557	1,300	51%
	Sophomore	6,397	3,373	53%
	Junior	7,132	4,114	58%
	Senior	12,269	7,512	61%
Race	Asian	5,829	3,137	54%
	Black	1,268	766	60%
	Hispanic	1,899	1,099	58%
	White	16,604	9,738	59%
	2 or More	1,302	745	57%
	Other	46	22	48%
	Not Indic	1,407	792	56%
Gender	Female	14,204	9,219	65%
	Male	14,151	7,080	50%
Residency	On-campus	9,261	4,540	49%
	Off-campus	19,110	11,765	62%

Table 2B. Percentage of students associated with EZproxy sessions by class level, gender, and residency, Winter 2019

VARIABLE	CATEGORY	NUMBER OF STUDENTS	EVER EZproxy SESSION	% ≥ 1 EZproxy
Class Level	Freshman	2,557	1,300	51%
	Sophomore	6,397	3,373	53%
	Junior	7,132	4,114	58%
	Senior	12,269	7,512	61%
Gender	Female	14,204	9,219	65%
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Table 3. Linear Mixed Effects Regressions on Semester GPA

Fall 2016 - Winter 2019 (4 or More Semesters)

	All	On-Campus	Off-Campus
VARIABLES	SEMESTER GPA	SEMESTER GPA	SEMESTER GPA
Ever EZproxy Session in Term	0.138***	0.0837***	0.171***
	(0.00304)	(0.00415)	(0.00419)
Observations	151,049	53,896	97,153
Standard errors in parentheses			
*** p < 0.001			

Table 4. Linear Mixed Effects Regressions on Cumulative GPA

Fall 2016 - Winter 2019 (4 or More Semesters)

VARIABLES	All CUMULATIVE GPA	On-Campus CUMULATIVE GPA	Off-Campus CUMULATIVE GPA
Ever EZproxy Session in Term	0.0201*** (0.000896)	0.0242*** (0.00190)	0.0144*** (0.000871)
Observations	151,049	53,896	97,153
Standard errors in parentheses			
*** p < 0.001			

DISCUSSION: DESCRIPTIVE STATISTICS

- Socio-demographics and academic background factors are associated with having at least one EZproxy session/term
- Females are more likely to have at least one EZproxy session/term (two-tailed t-test, $p < 0.001$)
- Upperclassmen are more likely to have at least one EZproxy session/term (Pearson χ^2 , $p < 0.001$)
- Off-campus students are more likely to have at least one EZproxy session/term (two-tailed t-test, $p < 0.001$)

DISCUSSION: REGRESSION RESULTS

- Having at least one EZproxy session/term is associated with semester GPA that is 0.14 higher
- But off-campus students benefit more than on-campus peers from having at least one EZproxy session/term
- Having at least one EZproxy session/term is associated with cumulative GPA that is 0.02 higher
- But on-campus students benefit more than off-campus peers from having at least one EZproxy session/term

LIMITATIONS

- Disentangling campus residency (on- versus off-campus), and digital access to library resources via virtual private networks (VPNs) versus proxy server
- Even with the random effects by individuals and schools in our panel mixed effects models, there are very likely unaccounted for academic, institutional, socioeconomic and demographic factors that impact student access via the proxy server
- Likely path-based factors in academic progression that are unaccounted for e.g., higher likelihood of research involvement

CONCLUSION

- Merging library use & student outcomes data yields valuable insights on links from library use to student outcomes
- Implications for library policy & practice e.g., 4 out of 5 undergrad nursing students live off-campus, but nursing is library-intensive program; can library curricular integration mitigate potential disparities from living off-campus?
- This work suggests a several possible future directions e.g., effect or impact of course selection on the need to use library-licensed resources

THE REST OF THE LLAP TEAM

- Nick Paulson*
- Michael Clark*
- Laurie Alexander
- Bryan Skib
- Maurice York
- Sebastien Korner

* Co-author



fkabo@umich.edu

dbradley@umich.edu

steasley@umich.edu

varnum@umich.edu

<https://libraryanalytics.org/>